

*Wind movement for the month.*

Stations.	Total for month.	Average daily.	Greatest in 24 hours.	Greatest hourly movement.
Point Reyes Light, Cal.....	24,072	776	1,673	88
Mount Tamalpais, Cal.....	16,871	544	1,189	78
San Francisco, Cal.....	10,040*	324	517	34
Point Lobos, Cal.....	15,431	498	929	60
Southeast Farallon, Cal.....	17,331	559	1,185	58

\* May, 1899, 10,346 miles.

The wind blew at a velocity equaling or exceeding 60 miles an hour for forty-three hours at Point Reyes Light, Cal., and nineteen hours at Mount Tamalpais.—*A. G. McAdie, Professor of Meteorology.*

**PORTLAND, OREG., FORECAST DISTRICT.**

May, 1903, in the North Pacific States, was cool and, in many places, unusually dry. Frosts, which, as a rule, were accurately forecast, occurred frequently east of the Cascade Mountains, and in consequence vegetation made slow advancement. No storm warnings were issued and there were no storms during the month.

The cool weather delayed the annual rise in the Columbia River, and at the end of the month the stream, although steadily rising, was well within its banks.—*E. A. Beals, Forecast Official.*

**RIVERS AND FLOODS.**

The rainfall over the Missouri and upper Mississippi watersheds was largely in excess of the usual amount during the month of May, and, as a natural consequence, high stages of water were experienced in both rivers. In the valley of the Kansas River and its tributaries the precipitation was especially heavy, averaging about seven inches above the normal amount for the month, and much the greater portion occurred during the last two weeks. The results of these unusual conditions were the great floods in the Kansas and lower Missouri, the Des Moines, and the Mississippi rivers from Keokuk to Cairo. These floods were the greatest ever known, with the exception of that of 1844, and were by far the most destructive. The stories of the losses of human lives and of the ruin and desolation at Topeka, Kans., Kansas City, Mo., and its suburbs, and at East St. Louis, Ill., are in a general way familiar to all, and need not be repeated here. The detailed histories of the floods are not yet completed and will be printed at a future time.

The rains were also exceptionally heavy in the valley of the Arkansas River, and stages above the danger lines were general from the Indian Territory to the mouth of the river. Considerable damage was done in the Territory, but none of any consequence to the eastward.

**CLIMATE AND CROP SERVICE.**

By Mr. JAMES BERRY, Chief of Climate and Crop Service Division.

The following summaries relating to the general weather and crop conditions during May are furnished by the directors of the respective sections of the Climate and Crop Service of the Weather Bureau; they are based upon voluntary reports from meteorological observers and crop correspondents, of whom there are about 3000 and 14,000, respectively:

**Alabama.**—The first two weeks were cool and wet; rainfall quite excessive in some eastern and west-central counties; considerable river-land corn drowned. The last two weeks were comparatively warm and dry. Much cotton and corn replanted, owing to damage by cold; at close of the month cotton was small and two to three weeks behind last year; corn also late, but both crops were improving slowly; worms damaged corn considerably, particularly on lowlands.—*F. P. Chaffee.*

Along the remaining rivers of the country conditions were quiet, with but a single incident or two worthy of special mention. In the navigable rivers the stages were all that could be desired for purposes of transportation by water. Heavy rains on the 14th and 15th over the Southern States caused moderate floods in the rivers of Alabama and lower Georgia. Warnings were issued in due time, and very little damage was done by the waters. All that has been reported was the flooding of some lowland corn along the Alabama River, necessitating replanting.

The annual rise of the Columbia River began on the 16th, and warnings of danger-line stages by the 21st were issued at Portland, Oreg.

The highest and lowest water, mean stage, and monthly range at 159 river stations are given in Table VII. Hydrographs for typical points on seven principal rivers are shown on Chart V. The stations selected for charting are Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock on the Arkansas; and Shreveport, on the Red.—*H. C. Frankenfield, Forecast Official.*

**AREAS OF HIGH AND LOW PRESSURE.***Movements of centers of areas of high and low pressure.*

Number.	First observed.			Last observed.			Path.		Average velocity.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
<b>High areas.</b>										
I.....	1, p. m.	48	123	5, a. m.	48	68	3,200	3.5	914	38.1
II.....	5, a. m.	50	100	9, p. m.	46	60	2,475	4.5	550	22.9
III.....	10, a. m.	50	100	12, a. m.	48	68	1,550	2.0	775	32.3
IV.....	10, a. m.	41	124	13, a. m.	48	86	2,675	3.0	892	37.2
Sums.....							9,900	13.0	3,131	130.5
Mean of 4 paths.....							2,475		783	32.6
Mean of 13.0 days.....									762	31.8
<b>Low areas.</b>										
I.....	4, p. m.	33	112	11, p. m.	27	80	2,450	7.0	350	14.6
II.....	8, p. m.	33	112	15, p. m.	27	80	2,700	7.0	386	16.1
III.....	16, a. m.	37	114	21, a. m.	50	64	3,450	5.0	690	28.8
IV.....	19, p. m.	37	118	23, p. m.	50	100	1,625	4.0	406	16.9
V.....	21, a. m.	52	121				1,200	2.5	480	20.0
VI.....	25, a. m.	35	112	29, a. m.	50	64	2,950	4.0	738	30.8
	27, p. m.	32	107	*1, p. m.	38	90	1,600	5.0	320	13.3
Sums.....							15,975	34.5	3,370	140.5
Mean of 7 paths.....							2,282		481	20.1
Mean of 34.5 days.....									463	19.3

\* June.

For graphic presentation of the movements of these highs and lows see Charts I and II.—*George E. Hunt, Chief Clerk, Forecast Division.*

**Arizona.**—During the first half of the month the weather was warm, but the latter half was cold, except for a few days at the end of the month. Heavy and damaging frosts occurred during the latter half of the second and the first half of the third decades in the colder portions of the Territory, but no frosts occurred in the more important agricultural valleys. The precipitation for the month was about normal; irrigation water was generally sufficient for the needs of vegetation, but it was deficient in some localities. Except where damaged by frost, crops did well. Fair to very good crops of grain were harvested in the more important agricultural valleys. The second crop of alfalfa began to be harvested in Maricopa County and the third in the lower Colorado Valley. The fruit crop was very good. Ranges afforded good grazing and cattle were in good condition.—*M. E. Blystone.*

**Arkansas.**—The first of the month was cool with general rains, which improved crops. Toward the close of the month warmer weather and

continued rains further advanced crops, but prevented cultivation, and at the close of the month all crops were grassy. Considerable cotton and corn were replanted; by the end of the month cotton chopping and cultivation of corn were general. Wheat and oats improved steadily, but did not promise good yields. Potatoes and gardens made steady improvement and good yields of potatoes were indicated. Frost injured all kinds of fruit and the yield will be short.—*Edward B. Richards.*

**California.**—Deficient rainfall and drying winds were unfavorable for grain and hay. The first of the barley crop was received at Stockton on the 29th; it was light and poor in quality. Haying was in progress. Deciduous fruits and grapes give indications of large crops.—*Alexander G. McAdie.*

**Colorado.**—The weather was too cool for normal advancement in crops, and prior to the closing days drouthy conditions prevailed east of the Continental Divide, with a scarcity of water for irrigation. Small grain made slow but favorable progress. Corn showed a good stand but slow growth; potatoes, on the other hand, did well. Owing to damage by frost at the close of April much replanting of sugar beets was necessary; good stands were obtained and the crop as a whole made favorable progress. In western counties the outlook continued promising for apples, pears, plums, and cherries, and fair for apricots and peaches. Ranges were generally poor, and stock showed little improvement prior to the heavy rains of the last decade.—*F. H. Brandenburg.*

**Florida.**—The temperature was lower than the average, with precipitation above the normal over the northern, central, and western districts, but deficient over the southern portion of the State. Rain was sufficient and fairly general during the second decade, the weather being dry during the other decades. During the greater portion of the month cool nights retarded the growth of cotton and corn, the stands of which were only fair, although warmer weather toward the last of the month improved all crops. Large shipments of pineapples were made, and peaches, melons, and cantaloupes were plentiful; citrus trees are in good condition.—*A. J. Mitchell.*

**Georgia.**—The weather during the first half of the month was cooler than usual and rain was prevalent. During the latter half of the month the temperature was generally seasonable and rainfall deficient; the rainfall for the month was excessive in numerous southern localities. Heavy hailstorms occurred in Jefferson and Putnam counties on the 3d and in portions of Thomas County on the 4th. Heavy rainfall and lack of high temperature and sunshine in the majority of sections were detrimental to crops. Cotton is very backward; wheat and spring oats inferior; fall oats fair to good; corn under size; sugar cane excellent. The yield of peaches is expected to be below average, but a good quantity of fruit is indicated.—*J. B. Marbury.*

**Idaho.**—Temperature and precipitation were somewhat below the normal; the deficiency in precipitation being principally confined to western and northern counties, the "dry farming" districts of the eastern counties receiving sufficient moisture for crop growth. Light frosts occurred frequently, being severe in localities about the 19th to the 21st, but in general the fruit crops escaped material injury. The month closed with unusually high temperature over the western districts.—*S. M. Blandford.*

**Illinois.**—The month opened unfavorably. Frost of damaging effect on fruits and tender vegetation occurred on the morning of the 1st. Adverse conditions for seeding, germination, plowing, and general farm work continued throughout the first and second decades. The ground was breaking in such hard and cloddy condition as to render planting of corn very difficult. Much needed rain occurred during the third decade. The ground was softened and wheat, corn, and grasses were greatly benefited. At close of the month much corn remained unplanted.—*Wm. G. Burns.*

**Indiana.**—First decade cool and dry, with frosts, damaging to fruits and tender plants, as late as 8th. Sowing of oats completed and corn planting progressed, but ground baked and cloddy. Drought continued through second decade, and vegetation made slow growth; corn planting was suspended. Rain during last week of month, ground too wet to work, planting corn unfinished; oats uneven and thin; wheat, clover, and timothy short but improving.—*W. T. Blythe.*

**Iowa.**—The month as a whole was unfavorable for field work, the average rainfall being double the normal amount. From the 3d to the 19th conditions were at their best, and during that period the best progress was made in plowing and planting corn. The last decade brought very heavy rains and floods and work was generally suspended. The best conditions prevailed in eastern districts. Corn was about two-thirds planted at close of month, with much replanting necessitated.—*John R. Sage.*

**Kansas.**—A cool, very wet May, greatly retarding farm work, and in some counties completely paralyzing it. Wheat in good condition, began heading in south the first of week, in central counties the second, and northern the third. Corn growth was slow; it needed sunshine and cultivation; much has been washed out, much replanting to do; much corn land still unplanted. Oats and grass rank. Alfalfa doing well, ready to cut. Potatoes improving. Early apples, peaches, and cherries greatly damaged by cold first of month; late cherries doing well, and apples fairly well.—*T. B. Jennings.*

**Kentucky.**—The first week was very cool, and frosts were reported in

many localities on the 1st and 2d. Considerable damage was done to tender vegetables, but the extent of the injury was not great. The temperature soon rose and was above normal the remaining three weeks. The rainfall was light until the 27th, and some localities in the eastern and central sections were suffering from drought. From the 27th to the 31st copious rains occurred, greatly improving crop conditions. The outlook at the close of the month was quite promising.—*H. B. Hersey.*

**Louisiana.**—The weather of the month was not altogether favorable for agricultural interests. Low temperatures during the first and second decades retarded germination of seed and growth of vegetation, but warmer weather during the last ten days of the month proved more favorable. After much replanting fair stands of cotton secured in most sections, but the crop is generally two to three weeks behind average seasons. Fall plant and stubble cane were, as a rule, doing nicely at the close of the month, but spring plant was not growing well. Good stands of rice were secured where irrigation was available, otherwise conditions are not satisfactory. Corn improved materially. Trucking interests were not up to the average.—*I. M. Cline.*

**Maryland and Delaware.**—Unbroken drought from the 5th to the 22d hurt all crops. Wheat withstood the dry weather fairly well, but oats and grasses suffered, while plowing, corn planting, transplanting of tobacco, and general trucking were greatly delayed. All growth revived when rains came, but strawberries and peas had already been cut short and the prospective hay crop much reduced. Of the fruit crops, apples alone are promising.—*Edward C. Easton.*

**Michigan.**—Killing frosts on first and second damaged peaches and early cherries to a large extent; some damage to young clover was also reported. The first half of month was quite drouthy, particularly in the lower peninsula. Showers nearly sufficient for immediate needs fell in all sections of the State after the 18th and drought was almost entirely relieved at close of month. Upon the whole, wheat, rye, meadows, pastures, oats, barley, and peas made fair growth after the 20th. By end of month corn and sugar beets had been mostly planted; both germinated nicely and were in promising condition. Early potatoes were mostly planted by the 15th and made good growth. Plowing for beans and late corn was delayed on account of dry soil until the 25th. The outlook for apples, pears, plums, and small fruits was encouraging at close of month.—*C. F. Schneider.*

**Minnesota.**—In the Red River Valley the month was dry and favorable for seeding an unusually large area; in southern Minnesota it was wet after the middle of the month, with rivers and creeks overflowed, low lands flooded and level lands wet, causing considerable delay to planting corn and potatoes, and some loss to small grains and sugar beets. Spring wheat seeding finished by the 15th, and oat, barley, and flax seeding well advanced. Higher temperatures after the 15th favored rapid growth of small grains, grasses, and potatoes, but corn was backward.—*T. S. Outran.*

**Mississippi.**—Unusually low temperatures first half of month were very unfavorable to germination and growth of cotton; much replanting was done and by close of month stands were generally good and chopping was in full progress, except in overflowed districts, where cut worms were very destructive and replanting continued. Corn generally did fairly well, and the early planted was being laid by. Oat harvest was begun, the yield being poor to fair. Sugar cane did well. Melons were late. Gardens and early Irish potatoes yielded well. Early peaches made a fair yield south. Apples were promising.—*W. S. Belden.*

**Missouri.**—The month was generally unfavorable for planting and cultivation. Corn ground broke up cloddy and in western sections planting was greatly retarded by rains. There was considerable complaint of poor stands; latter part of month the crop suffered for cultivation. Wheat continued promising in northern counties, but elsewhere was greatly damaged by rust, insects, and unfavorable weather. Oats and grasses did well. Freezing temperature occurred over nearly the entire State on the 1st, greatly damaging fruit. Much damage was done in the northern sections by floods in latter part of the month.—*A. E. Hackett.*

**Montana.**—The first two weeks were very dry; during the remainder of the month snows and rains were of frequent occurrence and placed the soil in a fairly moist condition, but cold weather retarded farm work and crop growth. Frosts occurred frequently and in some localities damaged alfalfa and wheat, but, as a rule, winter grain was in fair condition at the end of the month; forage crops and ranges gave promise of considerable improvement; the greater portion of the spring grain crops had been sown and the seeding of minor crops was in progress.—*Montrose W. Hayes.*

**Nebraska.**—The cool, wet weather was very favorable for the growth of wheat, oats, and grass, but the excessive precipitation retarded farm work. Corn planting progressed very slowly during the first three weeks and practically no progress was made during the last ten days; this left considerable corn to plant in June. Early planted corn came up nicely, grew slowly, and needed cultivation badly. Heavy rain last of month injured corn by washing and damaged wheat and oats in a comparatively small acreage in lowlands.—*G. A. Loveland.*

**Nevada.**—The weather conditions during the month were generally favorable to farming interests. Temperature and precipitation were both slightly below normal. Crops of all kinds made fairly good growth and at the close of the month were in excellent condition. Frosts during

the middle of the month did considerable damage to fruit blossoms in Nye County.—*J. H. Smith.*

**New England.**—Weather warm and extremely dry. Total precipitation at Boston 0.32 of an inch; lowest for May at Boston in records of the station and lowest for any month, except 0.31 of an inch in September, 1884. The drought very materially affected all crops, and especially hay, which is a very light crop; all vegetation was at a standstill and soil too dry for cultivation and for germination of seeds.—*J. W. Smith.*

**New Jersey.**—The prevailing weather conditions of the month were moderately warm days, cool nights, and a great deficiency of rainfall. Abnormally high temperature prevailed from the 18th to 21st, when 90° and above were recorded. The last killing frost occurred at all stations on the 2d. The long drought has seriously affected all vegetation and greatly delayed plowing, the ground being very hard and dry; much corn yet to plant.—*Edward W. McGinn.*

**New Mexico.**—Unusually dry, cold, and windy. Vegetation very backward; drought one of the severest in years in northeastern sections. Stock ranges bare of grass, but stock in fair condition. The lambing season resulted in a very fair increase.—*R. M. Hardinge.*

**New York.**—Snow flurries on May 1 and killing frosts on the 2d. Light frosts also occurred in places on the 30th and 31st. The most severe drought in fifty years or more continued throughout the month, no beneficial rains fell over a large portion of State in eight weeks. Hay was practically ruined, and wheat, rye, oats, and barley seriously damaged. Apples generally promising; other fruit light. Planting corn and potatoes not finished, and much to be replanted.—*R. G. Allen.*

**North Carolina.**—The first half of May was below the normal in temperature and quite unfavorable for the rapid growth of vegetation; light frost occurred on the 5th in the extreme west. The dry weather at first was favorable for farm work, which began to make more rapid progress, but the spring drought soon became of unusual duration, accompanied by a period of intense heat from the 18th to the 24th, and completely checked the growth of crops. At many places there were from twenty to thirty consecutive days without more than a trace of precipitation. Most of the corn and cotton crops was planted, but both came up very irregularly; transplanting tobacco was much delayed; wheat and oats did not improve materially. Prospects for fruit, especially apples, fairly promising. General improvement took place with favorable showers near close of month, but crops are very backward and inferior.—*C. F. von Herrmann.*

**North Dakota.**—The month was generally favorable for farm work and growth of vegetation. The first part was cool, with light showers and killing frosts, but no vegetation was sufficiently advanced to be harmed. It was quite warm during the middle of the month, followed by heavy rains in all sections, which caused rapid germination and subsequent vigorous growth of crops, which at the close of the month were in excellent condition.—*B. H. Bronson.*

**Ohio.**—Wheat is heading rather short, and there is much complaint of rust in the southwest, and its condition continues good in north and east; corn planting was delayed by the drought, but considerable progress was made during the last week of the month. Oats were short but improving; potatoes, gardens, and tobacco were doing well; peaches not promising, leaf curl reported in central and northern districts; many apples blown off by high winds.—*J. Warren Smith.*

**Oklahoma and Indian Territories.**—The decidedly low temperature on the first day of the month caused all early crops, vegetables, and fruit to suffer serious damage, but the favorable weather that followed aided their recovery to a large extent; excessive rains of the 23d and 28th caused floods that destroyed bottom land crops; hailstorms during the last ten days of the month damaged growing crops and fruit trees in localities; wheat, oats, rye, alfalfa, and grass made good growths; corn was cultivated once but was weedy, and only a fair stand at the close of the month; cotton was very backward, many fields were planted the second and third time; kaffir corn, broom corn, barley, cane, and millet are doing well; the hay prospect is very good; alfalfa was being cut with good yields; potatoes, gardens, and fruit are in good condition.—*Charles M. Strong.*

**Oregon.**—The month was cool, and in some sections unusually dry. Frosts occurred frequently east of the Cascade Mountains, and in consequence vegetation made slow advancement. Fall and spring sown grain are very backward, and at the close of the month vegetation in general was badly in need of rain. Hops that came up grew nicely, but quite a number of yards were abandoned, owing to the great number of missing hills. Fruit prospects, except peaches, continue promising.—*Edward A. Beale.*

**Pennsylvania.**—The average precipitation was only 37 per cent of the normal and the least for any similar period in the history of this service. Destructive frosts on the 1st and 2d. Drought conditions seriously retarded the advancement of winter grains and grasses, plowing, seeding, planting, and germination. Practically all crops in unsatisfactory condition at the close of the month and copious showers and sunshine needed.—*T. F. Townsend.*

**Porto Rico.**—At the beginning of the month plants were not prepared to resist the severe conditions which existed from the 1st to the 19th, and there was rapid deterioration of crops in general; in many places the small crops and ground provisions were entirely lost. Farming operations, excepting such as pertained to the harvesting of cane, were necessarily suspended. Pasturage and stock water became alarmingly

scarce. A hot wave of unusual intensity was experienced during the second decade. Quite general and copious rains set in on the 19th and continued almost daily to the end of the month, thus relieving the intense situation. Coffee crop promising. Cotton doing well.—*William H. Alexander.*

**South Carolina.**—The first half of May was dry and cool, with excessive cloudiness, and the last was warm and dry in the western and northern counties, but with ample precipitation in the central, southern, and eastern counties. During the first period crops were unfavorably affected, especially cotton, corn, and tobacco. The second period was more favorable and replanted fields came up to full stands. There was more than the usual amount of replanting done. There was a marked improvement in oats and a slight one in wheat. The former began to ripen and some was harvested. The fruit prospects were not impaired and early peaches were marketed. The season is backward for the staple crops and as far advanced as usual for the minor ones.—*J. W. Bauer.*

**South Dakota.**—Small grains, seeding of which ended early in the month, generally made very satisfactory progress, spring wheat attaining very promising condition. Heavy rains delayed corn planting on lowlands in the extreme southeastern section, but elsewhere planting was nearly finished and the early planted generally up by the 31st; poor seed and wet soil necessitated some replanting. Grass afforded good pasturage. Potato planting was nearly finished and the early planted grew nicely. Flax seeding progressed favorably.—*S. W. Glenn.*

**Tennessee.**—Excepting the abnormally low temperature of the first few days and the heavy rains near the end of the month, the weather was favorable for farming operations and for the growth of crops. Tobacco was set out generally under favorable conditions. At the close of the month cotton and corn showed good stands, as a rule. Wheat and oats had improved, and Irish potatoes and garden truck were doing well. The prospect for apples was fairly good, but poor for peaches.—*H. C. Bate.*

**Texas.**—Heavy frost occurred over the northern portion of the State on the morning of the 1st; cotton on lowlands was killed and had to be replanted; corn was cut to the ground, but came up again. The first part of the month was too cool for plant growth, but the temperature conditions of the latter half were more favorable. Moderate showers were general the latter part of the first decade, but rainfall was scattered and too light to be of much service the remainder of the month. Cotton continued very backward throughout the month; replanting was generally completed, but on the whole only fair stands were secured. Corn made rapid growth, and at the close of the month the early planted was tasseling as far north as the central counties. Both corn and cotton fields were kept in an excellent state of cultivation. Wheat, rye, and oats improved steadily, and were being harvested the latter part of the month.—*L. H. Murdoch.*

**Utah.**—Seasonable weather prevailed during the fore part of the month, but the latter part was remarkable for abnormally low temperatures and excessive precipitation. Spring wheat and oats were in good condition. Fall wheat is generally poor, although some improvement in this crop has been noted. Alfalfa made a rapid growth. Early sown beets were being thinned out, and the late sown were coming up rapidly. Fruit prospects were fair. The damage to the buds was found to have been greatly overestimated.—*R. J. Hyatt.*

**Virginia.**—Crop conditions throughout the month were variable. During the first and second decades the weather was dry and vegetation began to suffer. By the 23d crops were in poor condition, but fortunately a period of rainy weather set in at this time, which continued without intermission until the end of the month. Vegetation responded quickly to the changed conditions, and finished the month much improved, particularly, corn, pastures, mowing lands, and gardens.—*Edward A. Evans.*

**Washington.**—Although the mean temperature was but little below the normal, and the rainfall deficient, there was a general impression that the month was unusually cool and wet. The slow growth of vegetation was due to frequent frosts and the lack of real warm weather until the last week of the month. Crops were already backward at the beginning of the month, and the weather was not such as to give them the necessary impetus. Wheat, oats, barley, and vegetables began to thrive during the last week.—*G. N. Salisbury.*

**West Virginia.**—The lack of rain during the first three weeks of May had a very unfavorable effect upon vegetation, and the crops were threatened with material injury. Farm work was also retarded by the baked condition of the ground. The drought was finally broken on the 23d by copious showers, which continued during the rest of the month. At the close of May wheat and rye were heading and promising, oats were improving, pastures and meadows were making rapid growth, gardens were doing well, corn was coming up nicely, planting was nearly completed, and plowing was being pushed; there was little prospect of fruit, except a few apples and berries.—*E. C. Vose.*

**Wisconsin.**—Completion of seeding spring wheat, oats, and barley was delayed by heavy and continuous rains and early seedlings germinated poorly. Little progress was made in preparing ground for corn and potatoes. Winter wheat, rye, clover, and timothy made excellent progress and gave promise of heavy crops. Strawberries, plums, cherries, and currants were injured to some extent by freezing weather early in the

In the following table are given, for the various sections of the Climate and Crop Service of the Weather Bureau, the average temperature and rainfall, the stations reporting the highest

and lowest temperatures with dates of occurrence, the stations reporting greatest and least monthly precipitation, and other data, as indicated by the several headings:

*Summary of Temperature and Precipitation by Sections, May, 1903.*

Section.	Temperature—in degrees Fahrenheit.						Precipitation—in inches and hundredths.					
	Section average.	Departure from the normal.	Monthly extremes.				Section average.	Departure from the normal.	Greatest monthly.		Least monthly.	
			Station.	Highest.	Date.	Station.	Lowest.	Date.	Station.	Amount.	Station.	Amount.
Alabama.....	69.6	-1.6	Decatur.....	98	23	Haleysville, Riverton	34	1.5	Greensboro.....	14.81	Citronelle.....	2.71
Arizona.....	68.6	-3.2	Mohawk Summit.....	115	30	Ashfork.....	12	20	Flagstaff.....	1.35	11 stations.....	0.00
Arkansas.....	67.4	-2.5	Pocahontas.....	96	23	Pond.....	24	1	Mossville.....	14.88	Blanchard.....	2.34
California.....	63.5	+0.3	Imperial.....	118	13	Bodie.....	8	18	Redding.....	2.29	90 stations.....	0.00
Colorado.....	51.1	-2.9	Blaine.....	93	21	Breckenridge.....	2	5	Ruby.....	4.80	Garnett, Salida.....	T.
Florida.....	73.7	-1.9	Orange City.....	101	26	Quincy.....	49	1	Middleburg.....	18.01	Myers.....	0.71
Georgia.....	70.3	-1.3	Douglas, Quitman.....	103	25	Diamond.....	39	22	St. Marys.....	18.46	Elberton.....	2.12
Idaho.....	51.3	-1.7	Lewiston.....	102	31	Lake.....	18	18	Grangeville.....	3.73	Soldier.....	0.32
Illinois.....	65.3	+2.1	New Burnside.....	93	23	3 stations.....	24	1	Cambridge.....	7.03	Palestine.....	0.52
Indiana.....	65.4	+2.5	Madison.....	93	22	Bluffton.....	24	4	Northfield.....	7.75	Holland.....	0.88
Iowa.....	61.6	+1.4	Rome.....	93	24	Bedford, Earlham.....	24	1, 3	Thurman.....	15.45	Fort Madison.....	2.88
Kansas.....	62.4	-2.0	Clinton.....	91	20	Madison.....	20	1	Salina.....	17.34	Garden City.....	1.49
Kentucky.....	68.0	+1.8	Garden City.....	92	20	Fords Ferry.....	29	1	Hopkinsville.....	6.18	Taylorville.....	0.52
Louisiana.....	71.8	-2.4	Alpha.....	98	23	Oxford.....	30	3	Liberty Hill.....	5.97	Reserve.....	0.92
Maryland and Delaware.....	64.0	+1.0	St. Francisville.....	98	23	Deer Park, Md.....	24	2	Bachmans Valley, Md.....	4.78	Denton, Md.....	0.35
Michigan.....	56.4	+2.0	Darlington, Md.....	97	20	Iron River.....	10	1	Ishpeming.....	8.71	Mancelona.....	0.50
Minnesota.....	55.7	+0.9	Clinton.....	92	17	Floodwood, Mt. Iron.....	11	1	Worthington.....	12.68	Hallock.....	2.30
Mississippi.....	70.7	-1.8	3 stations.....	86	15, 16, 22	Duck Hill.....	34	2	Agricultural College.....	8.33	McNeill.....	1.36
Missouri.....	65.1	0.0	Aberdeen.....	98	28, 30	Montreal.....	23	1	Rockport.....	14.01	St. Louis.....	2.08
Montana.....	49.0	-4.2	New Haven, St. Louis.....	92	22	Livingston.....	10	18	Glasgow.....	5.35	Hayden.....	0.35
Nebraska.....	58.4	-1.2	Glasgow.....	98	13	Fort Robinson.....	16	1	Bradshaw.....	17.22	Kimball.....	1.56
Nevada.....	54.1	-2.1	Culbertson.....	98	14	Potts.....	15	17	Hamilton.....	2.92	5 stations.....	0.00
New England*.....	57.3	+2.0	Halsey.....	91	20	Fort Fairfield, Me.....	12	3	Eastport, Me.....	2.52	Burlington, Vt.....	T.
New Jersey.....	62.7	+2.3	Tecumseh.....	91	24	Layton.....	21	2	Cape May, C. H.....	1.32	Blairstown.....	0.08
New Mexico.....	58.3	-1.7	Rioville.....	106	30	Raton.....	18	1	Eagle Rock Ranch.....	1.55	3 stations.....	T.
New York.....	58.3	+2.4	Hartford, Norwalk, Conn.....	95	29	Paul Smith.....	10	2	Wappingers Falls.....	5.92	Bouckville.....	0.00
North Carolina.....	67.3	+0.2	Pateron.....	98	20	Linville.....	26	5	Highlands.....	6.44	Rockingham.....	0.44
North Dakota.....	54.3	+3.0	Carlsbad, Raton.....	99	18, 25	Mayville.....	11	1	Oakdale.....	7.83	Mayville.....	1.17
Ohio.....	63.9	+2.4	Oyster Bay.....	95	18, 20	New Bremen.....	22	4	Waverly.....	6.35	Cleveland.....	1.22
Oklahoma and Indian Territories.....	65.8	-3.2	Primrose.....	95	20	3 stations.....	24	1, 2	Blackburn, Okla.....	17.29	Eldorado, Okla.....	0.01
Oregon.....	54.7	-0.2	Salisbury.....	100	23	Grass Valley.....	11	7	Glenora.....	7.55	Blalock.....	T.
Pennsylvania.....	61.8	+2.3	Medora.....	96	14	Bend.....	11	16	Aleppo.....	4.65	2 stations.....	0.22
Porto Rico.....	78.3	+2.3	Napoleon.....	96	16	Dushore.....	18	2	Isabela.....	12.08	Conno.....	0.21
South Carolina.....	70.7	-0.9	3 stations.....	93	17	Barros.....	48	3	Beaufort.....	11.97	Liberty.....	0.25
South Dakota.....	57.9	-0.5	Durant, I. T.....	100	27	Heath Springs.....	44	12	Tyndall.....	11.47	Howell.....	0.79
Tennessee.....	67.7	+0.4	Coyote.....	105	30	Due West.....	44	2	Dickson.....	9.31	Bluff City.....	0.86
Texas.....	69.6	-3.3	Bowdle.....	99	15	Redfield.....	19	1	Sonora.....	5.76	El Paso.....	0.29
Utah.....	53.3	-3.4	Maryville.....	95	23	Rugby.....	30	2, 5	Ogden.....	4.34	Aneth.....	0.12
Virginia.....	65.0	+0.4	Fort McIntosh.....	99	30	Pope.....	30	3	Barboursville.....	5.80	Bedford City.....	0.77
Washington.....	54.5	-1.0	St. George.....	101	14	McKinney, Menardville.....	27	1	Clearwater.....	8.04	Trinidad.....	T.
West Virginia.....	64.3	+1.7	Columbia.....	99	21	Loa.....	15	17	Buchannon.....	6.24	Lillydale Station.....	0.80
Wisconsin.....	56.7	+1.5	Odessa.....	95	30	Columbia.....	28	2	Butternut.....	8.88	Racine.....	2.39
Wyoming.....	47.2	-4.0	Pasco.....	105	30	Burkes Garden.....	28	5	Thermopolis.....	3.16	Cheyenne.....	0.46
			Echo.....	95	21	Odessa.....	20	7				
			Byrne.....	95	27	Travellers Repose.....	20	2				
			Racine.....	90	19	Koeppenick.....	10	1				
			Basin.....	93	14	Four Bear.....	10	2				
						South Pass City.....	10	25				

\* Me., N. H., Vt., Mass., R. I., Conn.

month. Cranberry marshes were generally drained about the middle of the month and vines found in good condition. Tobacco plants are reported in good condition.—*W. M. Wilson.*

*Wyoming.*—The showers of the month were sufficient over most sections for the needs of crops and ranges, and at the close of the month ranges were in excellent condition at almost all parts of the State. The

unusually cold weather and prevailing frosts during the entire month prevented crops from making satisfactory growth, and some alfalfa was injured. At the close of the month the season was fully two weeks backward. The cold weather and storms of the month resulted in the loss of some lambs, calves, and shorn sheep. The good range feed placed all stock in fine condition by the close of the month.—*W. S. Palmer.*

## SPECIAL CONTRIBUTIONS.

### MARCH AND WINTER WINDS.

By Mr. WILLIAM B. STOCKMAN, Forecast Official.

After reading the interesting article by B. C. Webber, Esq., on "March winds" in Ontario, Quebec, and the Maritime Provinces of Canada, which appeared in the MONTHLY WEATHER REVIEW for March, 1903, it occurred to me that in the various parts of the United States where I have been stationed during the last twenty-five years, I had not experienced conditions similar to those that prevailed over Canada.

Believing it would be of general interest to know the average character of winds that prevailed over that portion of the

United States which would be under discussion, and to verify my own impressions, I selected 20 stations lying between the Atlantic Ocean and about the one hundredth meridian, west, and the northern border of the United States and the Gulf of Mexico, and compiled the subjoined data for the selected stations for the months of December, January, February, and March for a period of twenty years, so far as practicable.

In determining what should be considered a storm, a maximum velocity of 30 miles per hour was decided upon for inland stations, except for Dodge, Kans., which was raised to 35 miles on account of the high average wind movement obtaining at